

WHAT IS CLAIMED IS:

1. A cooling water pump device of an outboard motor, for pumping cooling water toward an engine of an outboard motor that includes a hollow driveshaft housing under an engine and a driving shaft vertically mounted in the driveshaft housing for transmitting the drive force of the crankshaft of the engine to a screw, comprising:

a pump case made of resin disposed at a position partway, with respect to the axial direction of the driveshaft, inside the driveshaft housing;

a sleeve made of metal fitted in the pump case;

an impeller made of elastic material mounted eccentrically in the pump case with the metal sleeve interposed therebetween, the impeller being rotated by rotational drive of the driveshaft to draw cooling water from the bottom of the pump case and pump the cooling water toward the engine located above; and

a plurality of annular seal elements for keeping the interface between the inner peripheral surface of the resin pump case and the metal sleeve watertight, arranged between the inner peripheral surface of the resin pump case and the metal sleeve, surrounding the driveshaft, and disposed at plural positions vertically apart with respect to the axial direction of the driveshaft.

2. The cooling water pump device for an outboard motor

according to Claim 1, wherein the pump case has an approximately bowl-like configuration having a bottom opening which is covered with an under-panel forming a pump chamber that accommodates the impeller, and at least the annular seal elements are arranged at an upper end of an ejection port of the pump chamber and at a place surrounding the driveshaft insert hole at an upper position of the pump case.

3. The cooling water pump device for an outboard motor according to Claim 1, wherein a plurality of joint seal elements that extend in the axial direction or radial direction of the driveshaft and connect the annular seal elements one to another, are provided so as to produce a unified structure of the annular seal elements made up of elastic resin material to keep the interface between the inner peripheral surface of the resin pump case and the metal sleeve watertight.

4. The cooling water pump device for an outboard motor according to Claim 3, wherein the lower annular seal element disposed between the bottom opening rim of the pump case and the under-panel and the upper annular seal element disposed at a place surrounding the driveshaft insert hole at an upper position of the pump case are connected by the joint seal elements, and at least the joint seal elements are arranged at both sides of the ejection port of the pump chamber.

5. The cooling water pump device for an outboard motor according to Claim 1, wherein grooves for receiving seal

elements are formed in the inner peripheral surface of the pump case.

- 5 6. The cooling water pump device for an outboard motor according to Claim 1, wherein ribs are formed in the interior surface of the pump case so as to create an air layer between the pump interior surface and the metal sleeve.